WHAT IS CLAIMED IS:

1. A method for optimizing a supply to meet a demand comprising the steps of:

determining a parts demand;

determining a machine supply;

maintaining a database of machine supply information, the machine supply information including, for each of a plurality of machine types, a number of machines of said machine type in the machine supply, a set of part types in said machine type, a corresponding monetary value for each part type, and a number of each part type in said machine type;

configuring an optimal dismantling configuration of the machine supply to meet the parts demand as a function of the machine supply information.

2. The method of claim 1 further comprising determining at least a portion of the parts demand that cannot be satisfied from the machine supply.

3. The method of claim 1 wherein the determining a parts demand step further comprises determining an internal demand and an external demand.

4. The method of claim 1 further comprising determining at least a portion of the machine supply that is not economically justified for dismantling.

5. The method of claim 4 wherein the determining at least a portion of the machine supply that is not economically justified for dismantling further comprises determining whether parts profit of a particular machine type is a predetermined percentage greater than machine profit of a particular machine type.

6. The method of claim 5 further comprising determining parts profit by adding an average machine net investment book value to a total parts de-manufacturing expense to produce a sum, and subtracting the sum from a total valued parts with external demands average fair market value.

7. The method of claim 5 further comprising determining machine profit by adding the average net investment book value of the particular machine type to a total re-manufacturing expense for the particular machine type to produce a sum, and subtracting the sum from an average fair market value for the particular machine type.

8. The method of claim 4 wherein the determining at least a portion of the machine supply that is not economically justified for dismantling further comprises determining whether parts profit of a particular machine is greater than machine profit of the particular machine.

9. The method of claim 8 wherein the parts profit is determined by adding a machine average net investment book value to a total parts de-manufacturing expense to produce a sum, and subtracting the sum from a book value, the book value equal to the total parts with internal demands average net investment book value with a cost adjustment to the net investment book value.

10. The method of claim 8 wherein the machine profit is determined by adding the particular machine type average net investment book value to a total machine re-manufacturing expense to produce a sum, and subtracting the sum from an average fair market value of the particular machine type model.

11. The method of claim 1 further comprising :

determining a corresponding parts supply from the machine supply; and,

matching the corresponding parts supply to the parts demand.

12. The method of claim 11 wherein the determining a corresponding parts supply further comprises the steps of:

determining the part types in a particular machine type;

determining the number of each of the part types in a particular machine type; and,

multiplying the number of each of the part types in a particular machine type by the number of machines for the particular machine type in the machine supply.

13. The method of claim 11 further comprising:

generating a covered parts list and a not-covered parts list if the part supply is less than the parts demand; and,

wherein the configuring step comprises:

determining the optimal dismantling configuration of the machines in the covered parts list; and,

determining the optimal dismantling configuration of machines to harvest from the not-covered list.

14. The method of claim 13 wherein the covered parts list is divided into an internal and an external list.

15. The method of claim 1 wherein the optimal dismantling configuration is determined by linear programming.

16. The method of claim 1 wherein the optimal dismantling configuration is determined

by maximizing a summation formula for revenue considering a number of factors for a part j and a machine i.

17. The method of claim 16 wherein the factors are:

revenue from parts j sales (RV_j);

net investment cost of machine (TC_i);

processing cost of de-manufacturing machine i (PC_i);

total supply of machine i (S_i) ;

netted demand of part j (D_j);

parts not utilized (W_{ij});

parts fulfillment (X_{ij});

machines required to fulfill the desired parts (Y_i).

18. The method of claim 17 wherein the summation formula is:

$$\sum_i \sum_j (RV_j \bullet \{X_{ij}\}) - \sum_i (TC_i \bullet \{Y_i\}) - \sum_i (PC_i \bullet \{Y_i\})$$

19. The method of claim 1 wherein the machine supply information further comprises the number of parts for each of the part types in each of the machine types.

20. The method of claim 1 wherein the machine supply information further comprises a forecast of machines expected to be available at a predetermined time.

21. The method of claim 1 wherein the machine supply information further comprises an estimated number of parts for each of the part types in each of the machine types.

22. The method of claim 1 wherein the machine supply information further comprises

fair market value of the part types and fair market value of the machine types.

23. The method of claim 1 wherein the machine supply information further comprises costs of de-manufacturing a specific machine type.

24. The method of claim 1 wherein the machine supply information further comprises data on the quality of parts yielded from de-manufacturing a specific machine type.

25. The method of claim 1 wherein the machine supply information further comprises codes for options on each of the machine types.

26. The method of claim 1 wherein the machine supply information further comprises quality of each of the machine types.

27. The method of claim 1 wherein the machine supply information further comprises times for demanufacturing cycles of a particular machine type.

28. The method of claim1 wherein the machine supply information further comprises times for refurbishing cycles of a particular machine type.

29. The method of claim 1 wherein the machine supply information further comprises repair costs for each of the part types.

30. An economic supply optimization system comprising:

a processor;

a data storage device operably connected to the processor, the data storage device providing data storage for the system;

a database of machine supply information on the data storage device, the machine supply information including, for each of a plurality of machine types, a number of machines of said machine type in the machine supply, a set of part types in said machine type, a corresponding monetary value for each part type, and a number of each part type in said machine type;

a program executable by the processor to

determine a parts demand;

determine a machine supply; and,

configure an optimal dismantling configuration of the machine supply to meet the parts demand as a function of the machine supply information.

31. The system of claim 30 wherein the program is further executable to determine at least a portion of the parts demand that cannot be satisfied from the machine supply.

32. The system of claim 30 wherein the program is further executable to determine at least a portion of the machine supply that is not economically justified for dismantling.

33. The system of claim 32 wherein the economic justification further comprises parts profit of a particular machine type being a predetermined percentage greater than machine profit of a particular machine type.

34. The system of claim 33 wherein the parts profit is determined by adding an average machine net investment book value to a total parts de-manufacturing expense to produce a sum, and subtracting the sum from a total valued parts with external demands average fair market value.

35. The system of claim 33 wherein the machine profit is determined by adding the

average net investment book value of the particular machine type to the total re-manufacturing expense for the particular machine type to produce a sum, and subtracting the sum from an average fair market value for the particular machine type.

36. The system of claim 32 wherein the economic justification further comprises parts profit of a particular machine being greater than machine profit of the particular machine.

37. The system of claim 36 herein the parts profit is determined by adding a machine average net investment book value to a total parts de-manufacturing expense to produce a sum, and subtracting the sum from a book value, the book value equal to a total parts with internal demands average net investment book value with a cost adjustment to the net investment book value.

38. The system of claim 36 wherein the machine profit is determined by adding the particular machine type average net investment book value to a total machine re-manufacturing expense to produce a sum, and subtracting the sum from an average fair market value of the particular machine type model.

39. The system of claim 30 wherein the program is further executable to:

determine a corresponding parts supply from the machine supply; and,

to match the corresponding part supply to the parts demand.

40. The system of claim 39 wherein the program is further executable to determine the corresponding parts supply by:

determining the part types in a particular machine type;

determining the number of each of the part types in a particular machine type; and,

multiplying the number of each of the part types in a particular machine type by the number of machines for the particular machine type in the machine supply.

41. The system of claim 39 wherein the program is further executable to:
generate a covered parts list and a not-covered parts list if the parts supply is less than the parts demand, and to configure the optimal dismantling configuration by:
determining the optimal dismantling configuration of the machines in the covered parts list; and,
determining the optimal dismantling configuration of machines to harvest from the not-covered list.

42. The system of claim 41 wherein the covered parts list is divided into an internal and an external list.

43. The system of claim 30 wherein the optimal dismantling configuration is determined by linear programming.

44. The system of claim 30 wherein the optimal dismantling configuration is determined by maximizing a summation formula for revenue considering a number of factors for a part j and a machine i.

45. The system of claim 44 wherein the factors are:
revenue from parts j sales (RV_j);
net investment cost of machine (TC_i);
processing cost of de-manufacturing machine i (PC_i);
total supply of machine i (S_i) ;
netted demand of part j (D_j);

parts not utilized (W_{ij});

parts fulfillment (X_{ij});

machines required to fulfill the desired parts (Y_i).

46. The system of claim 45 wherein the summation formula is:

$$\sum_i \sum_j (RV_j \bullet \{X_{ij}\}) - \sum_i (TC_i \bullet \{Y_i\}) - \sum_i (PC_i \bullet \{Y_i\})$$

47. The system of claim 30 wherein the machine supply information further comprises the number of parts for each of the part types in each of the machine types.

48. The system of claim 30 wherein the machine supply information further comprises a forecast of machines expected to be available at a predetermined time.

49. The system of claim 30 wherein the machine supply information further comprises an estimated number of parts for each of the part types in each of the machine types.

50. The system of claim 30 wherein the machine supply information further comprises fair market value of the parts and fair market value of each of the machine types.

51. The system of claim 30 wherein the machine supply information further comprises costs of de-manufacturing a specific machine type.

52. The system of claim 30 wherein the machine supply information further comprises data on the quality of parts yielded from de-manufacturing a specific machine type.

53. The system of claim 30 wherein the machine supply information further comprises

codes for options on each of the machine types.

54. The system of claim 30 wherein the machine supply information further comprises quality of each of the machine types.

55. The system of claim 30 wherein the machine supply information further comprises times for demanufacturing cycles of a particular machine type.

56. The method of claim1 wherein the machine supply information further comprises times for refurbishing cycles of a particular machine type.

57. The system of claim 30 wherein the machine supply information further comprises cost repairs for each of the part types.

58. Computer executable process steps operative to control a computer, stored on a computer readable medium, for determining an optimal dismantling configuration comprising the steps of:

determine a parts demand;

determine a machine supply;

configure the optimal dismantling configuration to meet the demand with a particular number and a particular type of machine from the machine supply.

59. The computer executable process steps of claim 58 further comprising:

maintaining a database of machine supply information, the machine supply information including, for each of a plurality of machine types, a number of machines of said machine type in the machine supply, a set of part types in said machine type, a corresponding monetary value for each part type, and a number of each part type in said

machine type;

configuring an optimal dismantling configuration of the machine supply to meet the parts demand as a function of the machine supply information.

60. The computer executable process steps of claim 58 further comprising a step to determine at least a portion of the parts demand that cannot be satisfied from the machine supply.

61. The computer executable process steps of claim 58 further comprising a step to determine at least a portion of the machine supply that is not economically justified for dismantling.

62. The computer executable process steps of claim 61 wherein the economic justification further comprises parts profit of a particular machine type being a predetermined percentage greater than machine profit of a particular machine type.

63. The computer executable process steps of claim 62 wherein the parts profit is determined by adding an average machine net investment book value to a total parts de-manufacturing expense to produce a sum, and subtracting the sum from a total valued parts with external demands average fair market value.

64. The computer executable process steps of claim 62 wherein the machine profit is determined by adding the average net investment book value of the particular machine type to the total re-manufacturing expense for the particular machine type to produce a sum, and subtracting the sum from an average fair market value for the particular machine type.

65. The computer executable process steps of claim 61 wherein the economic justification further comprises parts profit of a particular machine being greater than machine profit of the particular machine.

66. The computer executable process steps of claim 65 herein the parts profit is determined by adding a machine average net investment book value to a total parts de-manufacturing expense to produce a sum, and subtracting the sum from a book value, the book value equal to a total parts with internal demands average net investment book value with a cost adjustment to the net investment book value.

67. The computer executable process steps of claim 65 wherein the machine profit is determined by adding the particular machine type average net investment book value to a total machine re-manufacturing expense to produce a sum, and subtracting the sum from an average fair market value of the particular machine type model.

68. The computer executable process steps of claim 58 further comprising steps to:
determine a corresponding parts supply from the machine supply; and,
to match the corresponding part supply to the parts demand.

69. The computer executable process steps of claim 68 further comprising the step to
determine the corresponding parts supply by:
determining the part types in a particular machine type;
determining the number of each of the part types in a particular machine type; and,
multiplying the number of each of the part types in a particular machine type by the number of machines for the particular machine type in the machine supply.

70. The computer executable process steps of claim 69 further comprising the steps to:

generate a covered parts list and a not-covered parts list if the parts supply is less than the parts demand, and to configure the optimal dismantling configuration by:

determining the optimal dismantling configuration of the machines in the covered parts list; and,

determining the optimal dismantling configuration of machines to harvest from the not-covered list.

71. The computer executable process steps of claim 70 wherein the covered parts list is divided into an internal and an external list.

72. The computer executable process steps of claim 58 wherein the optimal dismantling configuration is determined by linear programming.

73. The computer executable process steps of claim 58 wherein the optimal dismantling configuration is determined by maximizing a summation formula for revenue considering a number of factors for a part j and a machine i.

74. The computer executable process steps of claim 73 wherein the factors are:

revenue from parts j sales (RV_j);

net investment cost of machine (TC_i);

processing cost of de-manufacturing machine i (PC_i);

total supply of machine i (S_i) ;

netted demand of part j (D_j);

parts not utilized (W_{ij});

parts fulfillment (X_{ij});

machines required to fulfill the desired parts (Y_i).

75. The computer executable process steps of claim 74 wherein the summation formula is:

$$\sum_i \sum_j (RV_j \bullet \{X_{ij}\}) - \sum_i (TC_i \bullet \{Y_i\}) - \sum_i (PC_i \bullet \{Y_i\})$$

76. The computer executable process steps of claim 58 wherein the machine supply information further comprises the number of parts for each of the part types in each of the machine types.

77. The computer executable process steps of claim 58 wherein the machine supply information further comprises a forecast of machines expected to be available at a predetermined time.

78. The computer executable process steps of claim 58 wherein the machine supply information further comprises an estimated number of parts for each of the part types in each of the machine types.

79. The computer executable process steps of claim 58 wherein the machine supply information further comprises fair market value of the part types and fair market value of the machine types.

80. The computer executable process steps of claim 58 wherein the machine supply information further comprises costs of de-manufacturing a specific machine type.

81. The computer executable process steps of claim 58 wherein the machine supply information further comprises data on the quality of parts yielded from de-manufacturing

a specific machine type.

82. The computer executable process steps of claim 58 wherein the machine supply information further comprises codes for options on each of the machine types.

83. The computer executable process steps of claim 58 wherein the machine supply information further comprises quality of each of the machine types.

84. The computer executable process steps of claim 58 wherein the machine supply information further comprises times for demanufacturing cycles of a particular machine type.

85. The method of claim1 wherein the machine supply information further comprises times for refurbishing cycles of a particular machine type.

86. The computer executable process steps of claim 58 wherein the machine supply information further comprises cost repairs for each of the part types.